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FULL-TEXT ARTICLE**RTP801 is a novel retinoic acid-responsive gene associated with myeloid differentiation.**Gery S, Park DJ, Vuong PT, Virk RK, Muller CI, Hofmann WK, Koefler HP.

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**OBJECTIVE:** Retinoids are crucial in the regulation of fundamental cellular processes including terminal differentiation of both normal and malignant myeloid progenitors. The aim of this study was to identify and characterize retinoic acid (RA) target genes. **METHODS AND RESULTS:** RTP801 is a recently cloned stress response gene that acts as a negative regulator of the mTOR pathway. Here we identified RTP801 as a novel early RA target gene in myeloid cells. RTP801 mRNA levels are induced in acute myeloid leukemia (AML) cell lines during RA-dependent differentiation and are differentially expressed during maturation of normal CD34(+) cells. The myeloid-specific, differentiation-related transcription factor C/EBPepsilon also induces RTP801 expression. Overexpression of RTP801 in the U937 leukemic cells leads to growth inhibition and apoptosis. Conversely, silencing of endogenous RTP801 by shRNA reduces RA-induced differentiation of the U937 cells. Downregulation of RTP801 also abrogates hypoxia-induced inhibition of mTOR in those cells. **CONCLUSION:** Taken together, our data suggest that RTP801 is an important RA-regulated gene involved in myeloid differentiation, which could represent a therapeutic target in leukemia.

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PMID: 17379067 [PubMed - indexed for MEDLINE]

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